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14. ABSTRACT The goal of this training program is to significantly extend our existing, highly successful Doctoral Training Program in Tumor Biology and several Cancer Center mechanisms that provide traditional postdoctoral training and junior faculty career development. The program integrates faculty from the Lombardi Comprehensive Cancer Center programs in Cancer Prevention and Control and Cancer Genetics, makes use of the existing organizational structure of the Interdisciplinary Doctoral Training Program in Tumor Biology, and incorporates a multidisciplinary faculty who are devoted to research and education in breast cancer. To date, 10 fellows have been recruited into the program (6 classes) and 4 new courses of study were added to our program. Fellows have published 14 papers with 4 more in process, and 9 abstracts. Two fellows have received independent postdoctoral fellowships and 4 fellows went on to academic faculty postdoctoral and US Government jobs; the other fellows in the program continue to make good career development progress.					
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A COMPREHENSIVE POSTDOCTORAL TRAINING PROGRAM IN BREAST CANCER

INTRODUCTION

The Comprehensive Postdoctoral Training Program in Breast Cancer Biology is successfully completing its sixth year. The goal of the program is to significantly extend our existing, highly successful Doctoral Training Program in Tumor Biology and several Cancer Center mechanisms that provide traditional postdoctoral training and junior faculty career development. The education and training of new investigators is essential to our progress in the prevention, detection, diagnosis, and treatment of breast cancer. The Postdoctoral Training Program in Breast Cancer provides comprehensive career development and integrates interactive research in the basic biology of breast cancer, formal and informal course work in key areas, and individualized guidance in career development. The program is enriched with both new and existing courses of interest to postdoctoral fellows covering scientific writing, teaching methodologies, scientific resources and technologies for cancer research, ethics in science, career development seminar series, and provides a firm foundation in the skills needed to succeed in a career in science, as well as a focused research experience in basic breast cancer biology in a strong laboratory environment. Additional programmatic activities include monthly Oncology Grand Rounds, weekly Tumor Biology Seminar Series, and weekly journal clubs. The program makes use of the existing organizational structure of the Interdisciplinary Doctoral Training Program in Tumor Biology and incorporates a multi-disciplinary faculty who are devoted to research and education in breast cancer. Postdoctoral fellows are given the opportunity to seek research and career advice from a number of senior faculty. The further development of this structured Tumor Biology Postdoctoral training program will provide excellent preparation for successful careers in cancer research. The grant was extended to 7 years in order to optimize our recruitment of the best qualified candidates for the available funds by postdoctoral fellows in the program.

BODY

Training and Research Accomplishments

The accomplishments of this program include the recruitment and progress of postdoctoral fellows. In the past 10 years, over 100 postdoctoral fellows have been trained by our Tumor Biology program preceptors. These fellows have an outstanding record of research productivity and peer-reviewed publication, and over 50% of them have obtained academic faculty level positions.

In the first year of the program, two postdoctoral fellows, Fadwa Attiga, Ph.D. and Tushar Deb, Ph.D., were recruited to the program. Dr. Attiga successfully completed her postdoctoral fellowship in Dr. Stephen Byer's lab, researching the cross regulation between the IKK and the beta-catenin signaling pathways in breast and colon cancers. Her research topics included a study of how different kinases regulate the level of oncogene beta-catenin protein level and transcriptional activity in tumors. A paper was published in Mol. Cell. Biol. describing Dr. Attiga's work; she subsequently took a faculty position as Instructor of Biology at American University, and is presently at the King Hussein Cancer Center in Jordan.

Dr. Deb has completed his postdoctoral fellowship in Dr. Robert Dickson's lab and is now an Assistant Professor of Oncology at Georgetown University. The main focus of Dr. Deb's research is to explore the EGF cell-survival signaling in transgenic MMTV-c-Myc expressing mammary epithelial cells. Proto-oncogene c-Myc sensitizes these cells to apoptosis in the absence of serum. A novel role of a calmodulin dependent kinase in this survival signaling process is also being explored. Dr. Deb has published two papers in J. Biol. Chem. describing this work.

Marcia Noble, Ph.D., and Kerrie O'Brien, Ph.D. were recruited into the second year of the program. Dr. Noble began her postdoctoral fellowship in September 2001, under collaborative mentorship of Dr. Michael Johnson and Dr. Robert Dickson. Dr. Noble's research focus was on the mechanism of VEGF to promote breast cancer metastases in transgenic mouse models. Dr. Noble completed her postdoctoral fellowship and is now an FASS Congressional Science Policy Fellow. Dr. Noble recently submitted a paper on her research to Cancer Research. A second paper was published in In Vitro Cell Biology (Animal). Dr. O'Brien began her postdoctoral fellowship in March, 2002 under mentorship of Dr. Robert Clarke. Dr. O'Brien's research focused on the resistance to retinoids in breast cancer. She recently published papers in Oncogene and Cancer Research.

Constanze Hample, Ph.D. was recruited into the third class of the postdoctoral fellowship program in September 2002 in the laboratory of Dr. Stephen Byers. Dr. Hample's research focused on Cadherin-11 and breast cancer invasion. She subsequently accepted a postdoctoral fellowship at Massachusetts General Hospital in Boston, and is presently a Medical Bioinformatician at the NCI.

Drs. Ming-Shuye Lee, Fransiscus Utama, and Ayesha Shajahan were recruited to the fourth class of this program. Dr. Lee began in September 2003 in Dr. Dickson's laboratory, Dr. Utama began in January 2004 with Dr. Rui, and Dr. Shajahan began in August 2004 with Dr. Clarke. Dr. Utama recently received an independent postdoctoral fellowship and presented an abstract at the 2005 Endocrine Society meeting in San Diego, CA. Dr. Lee published 2 articles in the American J. Physiology – Cell Physiology and presented his work at the Xth International Workshop on Plasminogen Activation Meeting, in Potomac, MD.

Dr. Yin Ji was recruited into the fifth class of the program in September 2004 in the laboratory of Dr. Stephen Byers. Dr. Yin Ji has recently published papers describing her work in J. Cell. Biochem. and J. Neurobiol.; and is presently a fellow at the Lombardi Comprehensive Cancer Center.

For the final, sixth class of the program, Dr. Chetana Revankar was recruited in September 2005 in Dr. Dickson's laboratory. Dr. Revankar has continued with her work on the c-Myc oncogene in breast cancer, in the laboratory of Dr. Johnson.

As noted earlier, our Postdoctoral Program incorporates elements of our existing Tumor Biology Ph.D. program, as well as new, Postdoctoral Training-specific elements as a part of a Breast Cancer Prevention Track. In addition to the existing core courses of the Interdisciplinary Doctoral Training Program in Tumor Biology, new course components have been incorporated into the Breast Cancer Prevention track in spring, 2002. These included a course in Biostatistics, *Applied Biostatistics* that has been refocused on statistical design and methodology for research rather than biostatistics theory and a Cancer Genetics course, *Genetics, Health, and Society in the 21st Century*, which focuses on practical and ethical questions raised by genetic information and technology. Both courses had very successful first, second, and third years, and will continue to be offered. A new course in Genetics, *Human and Microbial Genetics*, and an additional new course, *Cancer Prevention and Epidemiology*, were offered last year.

KEY ACCOMPLISHMENTS

- *Recruitment of Trainees and Progress of Trainees:*
 - One postdoctoral fellow, Dr. Chetana Revankar was recruited into the sixth class in September 2005, and is currently in Dr. Michael Johnson's laboratory.

- One postdoctoral fellow, Dr. Yin Ji was recruited in September 2004 into the fifth class, and is now in the laboratory of Dr. Stephen Byers.
- Three postdoctoral fellows were recruited into the fourth class (beginning September, 2003) of the Comprehensive Postdoctoral Training Program in Breast Cancer Biology: Dr. Lee (with Dr. Robert Dickson), Dr. Utama (with Dr. Hageir Rui), and Dr. Shajahan (with Dr. Robert Clarke).
- One postdoctoral fellow, Dr. Constanze Hampel, was recruited into the third class of the program. Dr. Hampel began her fellowship in September 2002 in the laboratory of Dr. Stephen Byers.
- Two postdoctoral fellows were recruited into the second class of the Comprehensive Postdoctoral Training Program in Breast Cancer Biology (beginning September 2001): Marcia Noble, Ph.D., and Kerrie O'Brien, Ph.D. Dr. Noble began the program in Dr. Michael Johnson's and Dr. Robert Dickson's laboratories, then took a Federal Government position in Science Policy, and more recently accepted a position as Patent Examiner for the Federal Government. Dr. O'Brien is working in Dr. Robert Clarke's laboratory.
- Dr. Deb, from the first class (beginning September 2000), successfully completed his postdoctoral fellowship and is currently an Assistant Professor in the Department of Oncology at Georgetown University.
- Dr. Attiga, from the first class (beginning September 2000), completed her first year with Dr. Stephen Byers and accepted a Research Instructor position at American University. Dr. Attiga is presently at the King Hussein Cancer Center in Jordan.
- Dr. Hampel, from the second class (beginning September 2002), has completed her fellowship here and accepted a postdoctoral fellowship at Massachusetts General Hospital in Boston, MA, and is presently at the National Cancer Institute.
- *New Courses Initiated Under This Program:*
 - *Human and Microbial Genetics (Elective Course)*
 - *Applied Biostatistics (Core Course)*
 - *Genetics, Health and Society in the 21st Century (Elective Course)*
 - *Cancer Prevention and Epidemiology (Core Course)*

REPORTABLE OUTCOMES

- *Career Placement:*
 - Dr. Attiga accepted a position as Instructor of Biology at American University (2002); and then as Assistant Director for Scientific Affairs at King Hussein Cancer Center – Jordan (2006).
 - Dr. Deb accepted a position as Instructor of Oncology at Georgetown University (2003); and was promoted to Assistant Professor of Oncology at Georgetown University (2005)

- Dr. Noble accepted a position as an FASS Congressional Science Policy Fellow (2004), and then as a Patent Examiner (2005)
- Dr. Hample accepted a postdoctoral position at Massachusetts General Hospital in Boston (2005), and recently accepted a position as a Medical Bioinformatician at the National Cancer Institute (2006).
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- *Independent Fellowships:*
 - **Dr. Utama** received a postdoctoral fellow from the Komen Foundation in 2005.
 - **Dr. Shajahan** received a postdoctoral fellow from the Komen Foundation and the Cancer Research and Prevention Foundation, in 2006.

CONCLUSIONS

The goal of the program is to significantly extend our existing, highly successful Postdoctoral Training Program in cancer with a new specialization in Breast Cancer Biology. We have successfully recruited 6 classes of Comprehensive Postdoctoral Training Program in Breast Cancer Biology (10 fellows) and have created 4 new courses. In addition, we have placed 4 fellows in their next career positions in academics and in science policy positions, while 5 fellows are still in training here. Finally, we would like to note that much of the success of this program is a result of the leadership of the PI, Dr. Robert Dickson, who passed away June 24th, 2006, a month before the end of this project.